

## Claims

- [c1] 1.A method for objectively monitoring a noise level occurring in a product during use comprising the steps of:  
imparting energy to the product to simulate an in use condition of the product;  
measuring the sound emitted from the product;  
establishing a threshold metric ;  
generating an objective metric based on the measured sound;  
comparing the objective metric with the threshold metric; and  
generating feedback, the feedback including information relating to the comparison of the objective metric and the threshold metric.
- [c2] 2.A method for objectively monitoring a noise level as set forth in claim 1 including the steps of:  
determining when the objective metric exceeds threshold metric;  
when the objective metric exceeds the threshold metric subjectively evaluating the noise emitted from the product to diagnose the reason for the objective metric exceeding the threshold metric; and  
performing any repairs necessary to the product such that the noise level of the product meets acceptable noise level standards.
- [c3] 3.A method for objectively monitoring a noise level as set forth in claim 1 wherein the step of generating an objective metric based on the measured sound includes the steps of acquiring sound data for a defined time period; and computing an objective metric based on an N10 loudness scale from the acquired sound data.
- [c4] 4.A method for objectively monitoring a noise level as set forth in claim 1 wherein the step of establishing a threshold metric includes the steps of:  
selecting a product that meets allowable noise level standards and measuring the sound level of said selected product; and  
using the measured sound level of the selected product to compute a threshold metric based on an N10 loudness scale.
- [c5] 5.A method for objectively monitoring a noise level as set forth in claim 1 including the steps of:

saving information related to the objective metric and the threshold metric;  
performing statistical processing based on the saved information; and  
preparing reports based on the saved information.

- [c6] 6.A method for objectively monitoring a noise level as set forth in claim 2 including the step of preparing at least one report as part of the step of generating feedback, said report providing information relating to repair information.
- [c7] 7. A method for objectively monitoring the noise level as set forth in claim 1 including the steps of:  
documenting any diagnosis and repair relating to the product;  
determining the most common cause of noise in the product; and  
providing possible suggestions to improve the product by reducing overall noise levels.
- [c8] 8.A method for objectively monitoring a noise level as set forth in claim 2 including the step of documenting, using a standardized as of comments and descriptors, the cause of the noise and any necessary repairs to the product.
- [c9] 9.A method for objectively monitoring a noise level as set forth in claim 8 wherein the standardized list corresponds to known warranty code parameters.
- [c10] 10.A method for objectively monitoring the sound level of vibration induced sounds on a vehicle comprising the steps of:  
placing a sound recording instrument in a position with respect to the vehicle to record sound emitted from the vehicle;  
connecting the sound recording instrument to a data acquisition apparatus;  
vibrating the vehicle and using the data acquisition apparatus to record the vibration induced sound;  
measuring the level of the vibration induced sound and computing an objective metric; and  
comparing the objective metric with a threshold metric.
- [c11] 11.A method for objectively monitoring the level of vibration induced sound on a vehicle as set forth in claim 10 wherein the objective metric and the threshold

metric are based on a N10 loudness scale.

- [c12] 12.A method for objectively monitoring the level of vibration induced sound on a vehicle as set forth in claim 10 wherein said step of comparing the objective metric with a threshold metric includes the steps of:
- evaluating the comparison of the objective metric with the threshold metric to determine whether the vibration induced sound level in the vehicle is unacceptable;
- when the evaluation indicates that the sound level is unacceptable, diagnosing the vehicle to determine the source of the unacceptable sound level;
- performing an appropriate repair; and
- confirming that the unacceptable sound level is no longer present.
- [c13] 13.A method for objectively monitoring the level of vibration induced sound on a vehicle as set forth in claim 12 including the step of documenting the diagnosis and repair.
- [c14] 14.A method for objectively monitoring the level of vibration induced sound on a vehicle as set forth in claim 12 including the step of using a graphical user interface and standardized list of descriptors to input into the data acquisition apparatus information pertaining to the diagnosis and repair.
- [c15] 15.A method for objectively monitoring the level of vibration induced sounds on a vehicle as set forth in claim 13 including the step of inputting into the data acquisition apparatus information pertaining to the diagnosis and repair.
- [c16] 16.A method of objectively monitoring the level out of vibration induced sound on a vehicle as set forth in claim 12 including the steps of:
- saving data relating to each vehicle tested including, the objective metric, threshold metric, and any diagnosis and repair; and
- performing a statistical analysis on the saved data.
- [c17] 17.A method for objectively monitoring the level of vibration induced sound on a vehicle as set forth in claim 12 including the steps of:
- saving data relating to each vehicle tested including, the objective metric, threshold metric, and any diagnosis and repair;

performing statistical processing on the saved data;  
generating feedback based on the statistical processing;  
reviewing the feedback to determine repair information; and  
using said feedback to develop corrective action to reduce the level of vibration induced sound.

- [c18] 18.A method of objectively monitoring the sound level occurring in a vehicle during operation comprising the steps of:  
placing a sound recording instrument within the vehicle;  
connecting sound recording instrument to a data acquisition apparatus;  
measuring and recording the sound level emitted from the vehicle during operation;  
computing an objective metric based on the recorded sound level;  
subjectively evaluating the vehicle to determine the source of the sound emitted from the vehicle when the objective metric exceeds a threshold metric; and  
if necessary, repairing the vehicle to reduce the sound to an acceptable level.
- [c19] 19.A method of objectively monitoring the sound level occurring in a vehicle during operation as set forth in claim 18 wherein the objective metric and the threshold metric are based on a N10 loudness scale.
- [c20] 20.A method of objectively monitoring the sound level occurring in a vehicle during operation as set forth in claim 18 including the steps of:  
documenting the evaluation and repair;  
saving data relating to each vehicle tested including, the recorded sound level, the objective metric, threshold metric, the evaluation and any repair;  
performing statistical processing on the saved data;  
generating feedback information based on the statistical processing; and  
using said feedback to develop corrective action to reduce the sound level in the vehicle.